MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
PERMIT

Issued To:

Aquila Resources
E 807 Gerue Street
Stephenson, Michigan 49887

Permit No:
Submission No.: 2NN-5PE0-MT3W
Site Name: Aquila Resources Inc-Back Forty Project
Issued:
Expires:

This permit is being issued by the Michigan Department of Environmental Quality (MDEQ), under the provisions of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); specifically:

- ☒ **Part 301, Inland Lakes and Streams**
- ☒ **Part 303, Wetlands Protection**
- ☐ **Part 315, Dam Safety**
- ☐ **Part 323, Shorelands Protection and Management**
- ☐ **Part 325, Great Lakes Submerged Lands**
- ☐ **Part 353, Sand Dunes Protection and Management**
- ☒ **Part 31, Water Resources Protection (Floodplain Regulatory Authority)**

Permission is hereby granted, based on permittee assurance of adherence to State of Michigan requirements and permit conditions, to:

Authorized Activity:

Excavate 980,820 cubic yards of material within 5.31 acres of wetland.

Place 803,453 cubic yards of fill within 5.91 acres of wetland, and within 253 linear feet of intermittent stream channel.

Indirectly impact approximately 17.17 acres of wetland as a result of reductions in surface water hydrology to the wetlands systems.

Place a 15-inch diameter outfall pipe at the ordinary high water mark of the Menominee River and place approximately 11 cubic yards of riprap.

Construct a total of 282 linear feet of mine site perimeter security fence through six wetlands areas and one intermittent stream. Fencing shall span the wetlands.

All activities to be conducted in accordance with the attached plans and the conditions of this permit.

Waterbody Affected: Unnamed Wetlands, Menominee River, Unnamed streams
Property Location: River Road, Stephenson, Menominee County, Lake Township,
Town/Range/Section: 35N/28W, S. 6, 7; 35N/29W, S. 1, 11, 12

Authority granted by this permit is subject to the following limitations:

A. Initiation of any work on the permitted project confirms the permittee's acceptance and agreement to comply with all terms and conditions of this permit.
B. The permittee, in exercising the authority granted by this permit, shall not cause unlawful pollution as defined by Part 31 of the NREPA.
C. This permit shall be kept at the site of the work and available for inspection at all times during the duration of the project or until its date of expiration.
D. All work shall be completed in accordance with the approved plans and specifications submitted with the application and/or plans and specifications attached to this permit.
E. No attempt shall be made by the permittee to forbid the full and free use by the public of public waters at or adjacent to the structure or work approved.
F. It is made a requirement of this permit that the permittee give notice to public utilities in accordance with 2013 PA 174 (Act 174) and comply with each of the requirements of Act 174.
G. This permit does not convey property rights in either real estate or material, nor does it authorize any injury to private property or invasion of public or private rights, nor does it waive the necessity of seeking federal assent, all local permits, or complying with other state statutes.
H. This permit does not prejudice or limit the right of a riparian owner or other person to institute proceedings in any circuit court of this state when necessary to protect his rights.
I. Permittee shall notify the MDEQ-WRD within one week after the completion of the activity authorized by this permit by completing and forwarding the attached preaddressed postcard to the office addressed thereon.
J. This permit shall not be assigned or transferred without the written approval of the MDEQ-WRD.
K. Failure to comply with conditions of this permit may subject the permittee to revocation of permit and criminal and/or civil action as cited by the specific state act, federal act, and/or rule under which this permit is granted.
L. All dredged or excavated materials shall be disposed of in an upland site (outside of floodplains, unless exempt under Part 31 of the NREPA, and wetlands).
M. In issuing this permit, the MDEQ has relied on the information and data that the permittee has provided in connection with the submitted application for permit. If, subsequent to the issuance of a permit, such information and data prove to be false, incomplete, or inaccurate, the MDEQ may modify, revoke, or suspend the permit, in whole or in part, in accordance with the new information.
N. The permittee shall indemnify and hold harmless the State of Michigan and its departments, agencies, officials, employees, agents, and representatives for any and all claims or causes of action arising from acts or omissions of the permittee, or employees, agents, or representative of the permittee, undertaken in connection with this permit. The permittee's obligation to indemnify the State of Michigan applies only if the state: (1) provides the permittee or its designated representative written notice of the claim or cause of action within 30 days after it is received by the state, and (2) consents to the permittee's participation in the proceeding on the claim or cause of action. It does not apply to contested case proceedings under the Administrative Procedures Act, 1969 PA 306, as amended, challenging the permit. This permit shall not be construed as an indemnity by the State of Michigan for the benefit of the permittee or any other person.
O. Noncompliance with these terms and conditions and/or the initiation of other regulated activities not specifically authorized shall be cause for the modification, suspension, or revocation of this permit, in whole or in part. Further, the MDEQ may initiate criminal and/or civil proceedings as may be deemed necessary to correct project deficiencies, protect natural resource values, and secure compliance with statutes.
P. If any change or deviation from the permitted activity becomes necessary, the permittee shall request, in writing, a revision of the permitted activity from the MDEQ-WRD. Such revision request shall include complete documentation supporting the modification and revised plans detailing the proposed modification. Proposed modifications must be approved, in writing, by the MDEQ-WRD prior to being implemented.
Q. This permit may be transferred to another person upon written approval of the MDEQ-WRD. The permittee must submit a written request to the MDEQ-WRD to transfer the permit to the new owner. The new owner must also submit a written request to the MDEQ-WRD to accept transfer. The new owner must agree, in writing, to accept all conditions of the permit. A single letter signed by both parties that includes all of the above information may be provided to the MDEQ-WRD. The MDEQ-WRD will review the request and, if approved, will provide written notification to the new owner.
R. Prior to initiating permitted construction, the permittee is required to provide a copy of the permit to the contractor(s) for review. The property owner, contractor(s), and any agent involved in exercising the permit are held responsible to ensure that the project is constructed in accordance with all drawings and specifications. The contractor is required to provide a copy of the permit to all subcontractors doing work authorized by the permit.
S. Construction must be undertaken and completed during the dry period of the wetland. If the area does not dry out, construction shall be done on equipment mats to prevent compaction of the soil.
T. Authority granted by this permit does not waive permit requirements under Part 91, Soil Erosion and Sedimentation Control, of the NREPA, or the need to acquire applicable permits from the County Enforcing Agent (CEA).

U. Authority granted by this permit does not waive permit requirements under the authority of Part 305, Natural Rivers, of the NREPA. A Natural Rivers Zoning Permit may be required for construction, land alteration, streambank stabilization, or vegetation removal along or near a natural river.
V. The permittee is cautioned that grade changes resulting in increased runoff onto adjacent property is subject to civil damage litigation.
W. Unless specifically stated in this permit, construction pads, haul roads, temporary structures, or other structural appurtenances to be placed in a wetland or on bottomland of the water body are not authorized and shall not be constructed unless authorized by a separate permit or permit revision granted in accordance with the applicable law.
X. For projects with potential impacts to fish spawning or migration, no work shall occur within fish spawning or migration timelines (i.e., windows) unless otherwise approved in writing by the Michigan Department of Natural Resources, Fisheries Division.
Y. Work to be done under authority of this permit is further subject to the following special instructions and specifications:

This permit is being issued for the maximum time allowed and no extensions of this permit will be granted. Initiation of the construction work authorized by this permit indicates the permittee's acceptance of this condition. The permit, when signed by the MDEQ, will be for a five-year period beginning at the date of issuance. If the project is not completed by the expiration date, a new permit must be sought.

This permit placard shall be kept posted at the work site, in a prominent location at all times for the duration of the project, or until permit expiration.

Any modifications to the site plan or scope or methods of the activities authorized under this permit that deviate from the project authorized under Mining Permit 01 2016, shall be reviewed by Oil Gas and Minerals Division (OGMD) for significance of amendment. This permit is not valid until any necessary amendment of the Mining Permit has occurred and a final copy has been provided to MDEQ-WRD.

In accordance with Mining Permit 01 2016, Condition E-10, a Cyanide Management Plan (CMP) shall be prepared in accordance with applicable state and federal standards. A certified copy of the CMP shall be provided to MDEQ, OGMD. No discharges are authorized by this permit prior to OGMD providing MDEQ Water Resources Division (WRD) written approval of the CMP.

In accordance with Mining Permit 01 2016, Condition B-3, the permittee shall prepare and implement a certified Spill Prevention Control and Countermeasures (SPCC) Plan for the fuel storage area that conforms to 40 CFR 112. The SPCC Plan shall comply with the Part 5 rules promulgated pursuant to Part 31 of the NREPA. No discharges are authorized by this permit prior to MDEQ-WRD providing written approval of the SPCC Plan to OGMD.

In accordance with Mining Permit 01 2016, Condition B-6, the permittee shall prepare a Pollution Incident Prevention Plan (PIPP) in compliance with R 324.2001 through R 324.2009 no less than 30 days prior to the initiation of the waste water treatment plant. No discharges are authorized by this permit prior to MDEQ-WRD providing written approval of the PIPP to OGMD.

The authorizations in this permit are limited to those identified above. This permit does not remove the permittee's liability or responsibility regarding any damage to adjacent properties, groundwater levels, or water wells in the vicinity of the project. Projects which include the pumping or discharge of water may require a National Pollution Discharge Elimination System (NPDES) permit under Part 31, Water Resources Protection, of the NREPA. Also, removal or pumping of groundwater that interferes with drinking water wells in the area are subject to dispute resolution as outlined in Part 317 Aquifer Protection and Dispute Resolution, of the NREPA. Water shall not be withdrawn from a lake, wetland, or stream in such quantity and/or duration so as to adversely impact or degrade water quality standards, aquatic life, riparian rights or uses. In addition, large quantity water withdrawal may require a permit be obtained from or an annual report be submitted to the MDEQ's Water Resource Division under the authority of Part 327, Great Lakes Preservation, of the NREPA.

The permittee is cautioned that grade changes resulting in increased or decreased runoff onto adjacent property is subject to civil damage litigation.

Notification shall be made through the permittee's MiWaters Account, five days prior to starting the project.

Authority granted by this permit does not waive permit or program requirements under Part 91, Soil Erosion and Sedimentation Control, of the NREPA, or the need to acquire applicable permits from the County Enforcing Agent (CEA), if applicable. To locate the Soil Erosion Program Administrator for your county visit **www.mi.gov/soilerosion** and look for Soil Erosion and Sedimentation Control Agencies under "SESC Info".

The authority to conduct the activity as authorized by this permit is granted solely under the provisions of the governing act as identified above. This permit does not convey, provide, or otherwise imply approval of any other governing act, ordinance, or regulation, nor does it waive the permittee's obligation to acquire any local, county, state or federal approval or authorization, necessary to conduct the activity.

A storm water discharge permit may be required under the Federal Clean Water Act for construction activities that disturb one or more acres of land and discharge to surface waters. For sites over five (5) acres, the permit coverage may be obtained by a Part 91, Soil Erosion and Sedimentation Control (SESC) permit, or coverage as an Authorized Public Agency (APA), and filing a "Notice of Coverage" form to the MDEQ's Water Resource Division. For sites with disturbance from one acre up to five acres, storm water coverage is automatic once the SESC permit is obtained or if work is being conducted by an APA. These one to five acre sites are not required to apply for coverage, but are required to comply with storm water discharge permit requirements. Information on the storm water discharge permit is available from the Water Resource Division's Storm Water Permit Program at **www.michigan.gov/soilerosion** under the "Construction Storm Water Info".

The permittee acknowledges that the dredged material has not been classified as to contaminant status. Disposal of the dredged sediments shall be to uplands. If the dredged sediments are determined to be contaminated at a future date, permittee and dredge sediments disposal location landowner are considered potentially responsible parties and remain liable for any and all necessary site restoration and clean up under Part 115, Solid Waste Management, and Part 201, Environmental Remediation, of the NREPA. If the permittee is not the dredge sediments disposal location landowner, permittee is responsible for notifying landowner of this condition.

Threatened and Endangered Species

The following threatened or endangered species are known to occur on or near this project site and may be impacted by your activities: Vasey's Rush (*Juncus vaseyi*) and Dwarf Milkweed (*Asclepias ovalifolia*). Issuance of this permit does not obviate the need to obtain approval under Part 365, Endangered Species, of the NREPA, from the Michigan Department of Natural Resources (MDNR) Natural Heritage Program prior to commencement of construction activity. Please contact Lori Sargent, Wildlife Division, MDNR, P.O. Box 30180, Lansing, MI 48909, or at 517-373-1263.

An updated threatened and endangered species survey will be required prior to seeking a permit for impacts to these species. Coordinate survey requirements with MDNR Wildlife Division Planning and Adaptation Section, Newberry Customer Service Center, 5100 State Highway M-123, Newberry, MI 49868; 906-293-5669 x4080.

A relocation plan for potentially impacted threatened and endangered species will be required. Coordinate relocation plan requirements with MDNR Wildlife Division Planning and Adaptation Section, Newberry Customer Service Center, 5100 State Highway M-123, Newberry, MI 49868; 906-293-5669 x4080.

Mussel Relocation

Mussel surveys and relocation shall be carried out in accordance with the approved mussel relocation plan, Appendix B-6 of the Wetlands Application dated October 2017. Any modification of this plan must be approved in writing from MDNR Fisheries Division and provided to MDEQ-WRD for final written approval.

Wetlands – General

Drainage of surface waters from wetlands is not authorized by this permit.

Prior to the start of construction, all adjacent non-work wetland areas shall be protected by properly trenched sedimentation barrier to prevent sediment from entering the wetland. Fencing shall be installed as needed to prohibit construction personnel and equipment from entering or performing work in these areas. Fence shall be maintained daily throughout the construction process. Upon project completion, the accumulated materials shall be removed and disposed of at an upland site, the sedimentation barrier shall then be removed in its entirety and the area restored to its original configuration and cover.

This permit is limited to authorizing the construction as specified above and carries with it no assurances or implications that associated lake, stream, wetland or floodplain areas can be developed and serviced by the structures authorized by this permit.

Fencing shall be elevated above the wetland to allow for the migration of reptiles, amphibians, and other small wildlife.

This permit does not authorize the direct discharge of surface, storm or waste waters to wetlands.

All raw earth within 100 feet of a lake, stream, or wetland that is not brought to final stabilization by the end of the active growing season shall be temporarily stabilized with mulch blankets by September 30.

All fill/backfill shall consist of clean inert material that will not cause siltation nor contain soluble chemicals, organic matter, pollutants, or contaminants. All fill shall be contained in such a manner so as not to erode into any surface water, floodplain, or wetland. All raw areas associated with the permitted activity shall be stabilized with sod and/or seed and mulch, riprap, or other technically effective methods as necessary to prevent erosion.

This permit does not authorize the placement of waste rock or overburden in wetlands prior to the placement of an approved lining system.

Extended Life of Mine

If the life of mine is projected to extend past the seven years proposed by this project, a permit will be required for impacts to aquatic resources regulated under Parts 301, Inland Lakes and Streams, and Part 303, Wetlands Protection, including, but not limited to, the drawdown or dewatering of regulated aquatic resources. Drawdown impacts may be considered when groundwater is reduced from natural elevation by six inches for fourteen or more consecutive days during the growing season.

If active pit dewatering is projected to extend past seven years or the location or volume of pumping changes, a revised groundwater model in accordance with MDEQ-WRD groundwater modeling recommendations and an impact assessment is required.

This permit does not authorize any future expansion of the mine or any extension of operations with the potential to result in additional direct, indirect or cumulative impacts to wetlands.

Utility

Utility instillation through wetlands and utility stream crossings are not authorized by this permit.

Secondary Wetland Impacts

Modeling

The Permittee shall collect a complete round of groundwater level measurements in all existing and any newly required wells (i.e., monitor wells, piezometers, drive point wells) as identified below prior to commencing any site activities. The data shall be collected in the same sampling event as wetland/stream stage and streamflow measurements to assemble a complete hydrological baseline condition prior to any site activities. Site monitoring wells and piezometers shall not be removed until this baseline sampling is completed. Based on the ERM 2011 hydrogeological information, water level data should be collected in March, mid-May, early June, July, August, September, and December for the baseline.

1. Specifically, the following groundwater level, vertical gradient, stream flow baseline assessment information shall be collected from all existing locations monitoring the Quaternary and Sandstone sediments by the Permittee before commencing any mining or site infrastructure activities. The baseline water level measurements are to include monitoring wells, piezometers, gages, flumes and other shallow water level monitoring points. The Permittee shall exercise the appropriate precautions in the construction of the deep wells to prevent leakage through any confining units separating shallow and deeper aquifers. Based on Aquila's current sampling locations, this will include at a minimum:

    - The water levels in all existing Quaternary and Sandstone site monitoring wells, piezometers shall be measured. This is currently expected to include piezometer pairs 1 through 24, monitoring wells MW-2, MW-3, MW-4, MW-5, MW-6S, MW-6D, MW-7, MW-8, MW-10, MW-12, MW-13S, MW-13D, MW-14, MW-15S, MW-15D, MW-16, MW-18S, MW-18D, MW-19, MW-20, FMW-1 through FMW-12, GMW-01 through 05, MW-2SS, MW-10SS, MW-11SS, MW-13SS, MW-15SS, MW-17SS, and MW19SS;

    - Pressure transducers shall be used to record continuous stage of the water level in the identified wetlands that exhibit standing water. Pressure transducers used in the wetland should be referenced to a common vertical datum (e.g. NAVD88). In addition, stream gages for measuring continuous stage and discharge will be placed in the streams identified on-site. Flumes shall be installed and data shall be electronically collected in any stream that exhibits intermittent flow to determine discharge;

    - Additional vertically nested well pairs to measure water level and vertical gradients shall be installed in any wetland area connected to the aquifer that is not currently being monitored. Measurement of any additional well pairs needed shall be included in the baseline monitoring;

    - The groundwater level data collected for the baseline as well as subsequent quarterly water level monitoring should be provided to MDEQ-WRD in print and in electronic Excel data table format. These tables should include the location name, associated wetland if applicable, latitude and longitude in decimal degrees, screen length (ft), top of screen (ft), bottom of screen (ft), date collected, water level elevation (ft) above mean sea level (AMSL), water level depth (ft) below ground level, and any other comments relevant to the data quality or monitoring events.

    - On-site vertical hydraulic conductivity of the wetland sediments, vertical and horizontal conductivity of glacial sediments adjacent to the wetlands, and vertical conductivity of river bottom sediments shall be collected if not already available for all existing wetlands currently on-site. A work plan detailing sampling methods and locations to collect this data will be developed and submitted to MDEQ-WRD for approval prior to sampling or any mining or infrastructure related site activities commence.

- Streamflow measurements will be collected in all site streams that drain offsite and this updated information will be compared with the streamflow measurements conducted by ERM from 2007 to 2009 as detailed a September 2011 report titled *A Hydrogeology Report: Environmental Baseline Studies* for the Aquila Site. This information shall be used in the calibration of a MODFLOW groundwater model to assess wetland impacts.

- Existing data from soil boring locations FSB-101 through FSB-113A, AND FSB-115A, 117, 118A through FSB-165 shall be used to define the wetlands in addition to supplemental soil borings required as part of the wetland baseline assessment.

- The permittee shall document the baseline sampling results in a report noting any climate or physical conditions that may affect the sampling and provide this documentation to MDEQ-WRD within 4 weeks of the completion of data collection and prior to commencing any site mining or infrastructure activities.

- Water level and vertical gradient monitoring shall be collected monthly with a report documenting the data, any water level or vertical trends observed, print and electronic data table presenting site measurements. This report shall be submitted on an annual basis by no later than December 31 annually.

2. A revised MODFLOW groundwater model using appropriate methods for defining wetland cells shall be developed that will incorporate site-specific groundwater hydrogeology and geology information (e.g., horizontal and vertical conductivity of the glacial, wetlands, and streambed sediments) to be used to integrate the site wetland, stream, and groundwater level data to assess the aquifer interconnection to the wetlands. The goal of the revised groundwater model will be to aid in the interpretation of the hydrologic processes and assess the evaluation of any potential effects of drawdown/dewatering that the mining operations may have on the site wetlands. The permittee shall complete the revised MODFLOW model prior to any site activities related to mining and infrastructure and present the groundwater modeling report in conjunction with the wetland drawdown analysis to MDEQ-WRD for review and approval. At a minimum, this revised groundwater model shall include:

    - The revised calibrated steady-state model representing initial conditions prior to mining operations shall include all site wetlands (not just the wetlands expected to be impacted by site operations) to obtain an appropriate estimate of initial conditions so that changes in water levels associated with site operations can appropriately be assessed.

    - Site-specific horizontal and vertical hydraulic conductivity data collected from each wetland identified on-site and from the adjacent glacial sediments will be used in the conceptual model design;

    - Revised transient models that include a scaled monthly recharge rate based on the average annual recharge rate for the area and seasonal trends observed for the site data. The models shall estimate the monthly water level changes and flux changes in and out of each wetland;

    - Revised transient models for post-closure of mining activities shall be developed;
    - Appropriate boundary cell definitions shall be documented for each wetland based on the connection to the aquifer as established by on-site soil boring and water level measurements in each wetland (e.g. drain, lake, river, or stream boundary condition, or general);

    - Provide justification for the definitions used to represent each wetland on-site. This could include the use of either drain, lake, or river boundary cells for example, as appropriate.

    - The wetland boundary cell type selected for each wetland will be defined using the site-specific data collected from the site area including information provided in site soil borings such as

sediment type, aquitard presence, wetland thickness determination, stage data, flow data, vertical conductivity, and horizontal conductivity of the wetland and adjacent glacial sediments.

- Model calibration and verification results table and map showing a comparison of the measured and simulated calibration targets and residuals with a description of procedures;

- A table showing the results of sensitivity analyses showing the range of adjusted model parameters and resulting change in the hydraulic heads or groundwater flow rates;

- Iso-contour maps showing the measured and simulated hydraulic-head distribution in feet;

- Iso-contour maps of the top and bottom elevation of the aquifer(s) in feet;

- Drawdown contour maps extending to a minimum of a 0.5 foot contour shall be provided;

- A map showing the model area distribution of the hydraulic conductivity for each layer and the leakance or vertical conductivity used for each layer in feet/day;

- A table showing the aquifer parameters used for each layer in the revised model and how these were determined for each model component [measured wetland vertical conductivity, thickness of the wetland sediments/depth to confining layer (if any), adjacent glacial sediment horizontal and vertical conductivity];

- A map showing the model grid with locations of different boundary conditions used in the model (feet);

- Maps clearly illustrating locations, water level predictions, drawdown contours as noted above, and all wetlands, streams, lakes, rivers included in the model;

- All figures presented in the report should be drawn to the same scale (feet or miles as appropriate) and datum based on the data illustrated (e.g., all drawdown contour maps at the same scale and datum, all regional water level maps at the same scale and datum, etc.);

- A discussion of the limitations of the model's representation of the actual hydrologic system and the impact those limitations have on the results and conclusions presented in the report;

- Submission of an updated standard Groundwater Modeling Report (including Model Conceptualization, Model Calibration, History-Matching, Sensitivity and Uncertainty Analysis, Parameter Estimation, Predictive Simulations, Recommendations and Conclusions) shall be submitted;

- Electronic data files for all data tables (e.g., Excel, .csv); maps (.pdf and shapefile or .mxd files); and all software input and output files shall be provided. The datasets for the different simulations (model calibration, history matching, and predictive simulations) need to be supplied in digital format.

- The flux information generated from this revised calibrated groundwater model shall be used to assist with the development of wetland budgets (that include data consistent with water levels observed during the growing season (mid-May through end of September) to provide the information necessary to assess the potential wetland impacts.

3. Following the baseline data collection, the Permittee shall monitor the water levels at each Quaternary and Sandstone groundwater monitoring well or piezometer generally on a quarterly basis with measurements collected in June, September, December, and March plus a data collection event in mid-May (the start of the growing season) at a minimum. The monitoring results are to be submitted in print and electronic format on an annual basis. At the end of each year period the permittee will provide an analysis of water level trends observed and identify any areas where additional monitoring points are needed, locations that could be revised, or potential impacts identified (drawdown and dewatering). The Permittee shall notify MDEQ-WRD within 15 days of potential impact discovery and provide a proposed action plan for adaptive management that includes proposed action timelines for MDEQ-WRD review and approval.

4. Site groundwater level, stream/wetland stage and streamflow data measurements shall be used to validate the revised MODFLOW groundwater model developed to assess wetland impacts and provide a report that details the findings including any need to revise the existing model based on the new data. The effectiveness of the groundwater model shall be reviewed on an annual basis.

5. The permittee shall provide a mitigation plan to address identified impacts should the drawdown or water level declines observed in the monitoring data exceed what is predicted based on the updated wetland groundwater model and site measurements.

6. Should the data not support the revised groundwater model, the conceptual model shall be reviewed and recommended changes to the model along with a schedule for completion shall be submitted in writing to MDEQ-WRD for approval.

7. The Permittee shall submit a Quality Assurance Project Plan (QAPP) and Work Plan to the MDEQ-WRD. The Work Plan for installation of the vertical nested wells, water level measurements, and collection of vertical and horizontal hydraulic conductivity data, shall provide details on specific location, screen lengths, screen elevations, screened interval, and construction details for the nested well pairs. The QAPP shall include all methods used, equipment used, monitoring frequency, equipment calibration, staff qualifications, data and document reporting, and method references. This permit does not authorize the installation of scientific measuring devices. A permit is required from MDEQ-WRD for the installation of scientific measuring devices in regulated areas.

8. A Part 327 registration shall be obtained by the Permittee if the rated pump capacity for all pumps used on the site to remove water (dewatering pumps, potable water wells, process water wells, or wetland augmentation pumps) at the site equal or exceed a rate of 70 gallons per minute before proceeding with the installation and use of such pumps.

9. Within 60 days of MDEQ-WRD approval of a final groundwater model, the permittee is required to submit a comprehensive assessment of potential impacts to private wells in Michigan and Wisconsin that may result from the mining operations.

Wetland Watershed Budgets

Upon approval of the revised groundwater model, the groundwater flux data shall be used to complete the Pierce models provided to MDEQ-WRD on April, 27, 2018. The watershed budgets shall reflect a normal, wet and dry hydrologic years on a wetland by wetland basis. The final wetland watershed budgets shall be presented to MDEQ-WRD for review and approval.

Sufficient soil borings originating from each wetland shall be taken and permeability rates shall be verified and incorporated into the Pierce model.

The revised wetland watershed budgets shall be incorporated into the secondary impacts analysis. A secondary impact analysis shall, at a minimum, include the following: the location of the impact, the type of

impact, the source of the impact (i.e. loss of surface water, loss of groundwater, increased infiltration, etc.), and clearly defined and precise metrics for the determination of impacts that are reproducible and repeatable.

Wetlands hydrographs representative of the Pierce model shall be provided in conjunction with the indirect impacts analysis. Reductions of hydrology greater than 6 inches for greater than 14 days of the growing season (May 16 to September 28) will constitute an impact to wetlands and require corrective measures to be implemented including avoidance and minimization of impacts, identification of feasible and prudent alternatives and implementation of adaptive management measures.

An approved secondary impacts analysis shall be the basis for the final mitigation requirements determination.

Water Quality

MDEQ-WRD has determined that a Part 22 groundwater discharge permit will be required upon the cessation of mining activities and the backfilling of the pit. To ensure that the project is able to meet State of Michigan requirements for groundwater discharge, prior to the initiation of activities authorized by this permit a groundwater discharge permit (GDP) should be obtained or a basis of design shall be approved by the WRD Groundwater Permits Unit.

The final closure plan shall be reviewed and approved by MDEQ-WRD no less than 90 days prior to initiating closure activities.

Riprap

All riprap shall be properly sized and graded based on wave action and velocity, and shall consist of natural field stone or rock (free of paint, soil or other fines, asphalt, soluble chemicals, or organic material). Broken concrete is not allowed.

Floodplain

The project shall be constructed in accordance with plans prepared by Aquila Resources Inc. (and their consultants) and filed with the MDEQ-WRD on October 2, 2017.

This permit does not authorize placement of any other fill or structures within the 100-year floodplain of the Menominee River, nor any grading or modifications to the floodplain, other than the outfall pipe and riprap previously listed.

Any additional work proposed within the 100-year floodplain of the river will require prior authorization by MDEQ-WRD.

Monitoring

No less than one year prior to the initiation of surface facility construction, groundwater monitoring wells and piezometers shall be installed in the locations as shown on Figure 1: Monitoring Transects.

In accordance with Mining Permit MP 01 2016, condition K-26, the permittee shall install a well nest within WL-40/41 to monitor for wetland impacts. The well nest shall be included as part of an approved wetland monitoring plan.

Baseline Assessment

The following wetland baseline assessment information shall be collected by the permittee prior to initiation of any construction or vegetation clearing on the site. As part of a baseline assessment and

monitoring plan, a minimum of three offsite reference wetlands shall be located and baseline information, including water table data, shall be collected at each reference location in addition to the baseline requirements detailed below.

a. All onsite and reference wetland boundaries shall be flagged in the field and surveyed using a submeter accuracy GPS. The shapefiles of the wetland boundaries shall be provided, along with a figure, to MDEQ-WRD.

b. Baseline information shall be collected for the wetland located in the Shakey Lakes Natural Area, DNR Compartment 109. Staring on mining year 3, this wetland shall be included in the annual field survey and monitoring efforts. Baseline information on this wetland shall include a threatened and endangered species meander survey conducted between July 15 and August 31. A monitoring well transect shall also be installed and documentation shall be included in the annual monitoring report submitted to MDEQ-WRD. A MDNR use permit is required for these monitoring activities at this location.

c. Any reduction in wetland area over 0.01 acre per wetland shall be noted and reported to DEQ. The boundaries of wetlands WL-6, WL-2b, WL-A1, WL-A3, WL-C1, WL-40/41, WL-B1/b1c, and WL-B3 shall be permanently staked in the field in accordance with the 2017 wetland delineation and MDEQ-WRD Wetland Identification Program report to allow for quick visual assessment of changes to wetland boundaries.

d. The permittee shall conduct a detailed comprehensive floristic quality assessment (using FQI and mean C) in the following wetlands: WL-6, WL-2b, WL-A1, WL-A3, WL-C1, WL-40/41, WL-B1/B1c, and WL-B3. The initial baseline survey shall be completed 3 times (early June, mid-July and late August) throughout the growing season prior to initiation of any construction or land clearing activities to document floristic quality of the wetlands and document any Threatened, Endangered or Special Concern species, as well as plants that have a high C value. A qualified botanist shall conduct the survey.

e. The permittee shall develop a hydrology monitoring plan for MDEQ-WRD approval and install monitoring wells located at 100 foot intervals along monitoring transects shown on Figure 1. A minimum of one growing season hydrology data shall be collected and submitted to MDEQ-WRD prior to initiation of construction.

f. The permittee shall develop a water chemistry sampling plan for MDEQ-WRD approval in wetlands WL-6, WL-2b, WL-A1, WL-A3, WL-C1, WL-40/41, WL-B1/B1c, and WL-B3 that includes dissolved oxygen, pH and conductance.

Monitoring Plan

Prior to the initiation of activities authorized by this permit, the permittee shall develop a detailed wetland boundary, vegetation, hydrology and chemistry monitoring plan that covers the duration of the project. The monitoring plan shall be submitted to the MDEQ-WRD and approved and initiated one year prior to the start of construction activies at the project site. Minimum monitoring components shall include:

1. The permittee shall survey the boundaries of all regulated wetlands within the project site using a submeter accuracy GPS. The following wetland boundaries shall be verified in the field annually to detect potential changes to wetland boundaries: WL-6, WL-2b, WL-A1, WL-A3, WL-C1, WL-40/41, WL-B1/B1c, WL-B3, and the wetland within the Shakey Lakes Natural Area starting on mining year 3. The following wetland boundaries shall be verified in the field every two years to detect potential changes to wetland boundaries: WL-17, WL-14/14a, WL-56, WL-58, WL-62, WL-64, WL-66, WL-68, WL-70, WL-72, WL-73.

2. The permittee shall survey the boundaries of the offsite reference wetlands annually using a submeter accuracy GPS.

3. The permittee shall conduct a floristic quality assessment annually in wetlands WL-6, WL-2b, WL-A1, WL-A3, WL-C1, WL-40/41, WL-B1/B1c, WL-B3 between July 15 and August 31.

4. The permittee shall develop a detailed vegetation sampling plan to detect potential changes to wetland hydrology and plant communities. The sampling plan shall include transects in wetlands WL-6, WL-2c, WL-A1, WL-A3, WL-C1, WL-40/41, WL-B1, WL-B1c and WL-B3, which shall be oriented perpendicular to groundwater contours. A qualified individual able to identify plants to genus and species must conduct the wetland vegetation monitoring. The MDEQ-WRD reserves the right to reject reports with substandard monitoring data. The following procedure must be used when sampling transects:

   Sample vegetation in plots located along transects annually between July 15 and August 31. The number of sample plots necessary within each wetland type shall be determined by use of a species-area curve or other approach approved by the MDEQ-WRD. The minimum number of sample plots for each wetland transect shall be no fewer than five (5) except for WL-B3 and WL-B1c, which shall be no fewer than two (2). Sample plots shall be located on the sample transect every 100 linear feet. If additional or alternative sample transects are needed to sufficiently evaluate each wetland type, they must be approved in advance in writing by the MDEQ-WRD.

   The herbaceous layer (all non-woody plants and woody plants less than 3.2 feet in height) shall be sampled using a 3.28 foot by 3.28 foot (one square meter) sample plot. The data recorded for each herbaceous layer sample plot shall include a list of all living plant species, and an estimate of percent cover in one (1) percent intervals for each species, bare soil areas, and open water areas relative to the total area of the plot.

   Provide plot data and a list of all the plant species identified in the plots and otherwise observed during monitoring. Data for each plant species must include common name, scientific name, wetland indicator category from the U.S. Army Corps of Engineers 2012 National Wetland Plant List for Michigan (Lichvar, R.W. 2012), physiognomic classification, coefficient of conservatism, and whether the species is considered native according to the Michigan Floristic Quality Assessment (Michigan Department of Natural Resources, 2001). Nomenclature shall follow in the *Flora of North America*, which can be found at www.fna.org.

   The locations of sample transects and plots shall be identified in the monitoring report on a plan view showing the location of wetland types. Each transect and sample plot shall be permanently and visibly staked at a frequency sufficient to locate the transect and sample plots in the field.

5. The permittee shall conduct a meander survey annually in wetlands WL-6, WL-2b, WL-A1, WL-A3, WL-C1, WL-40/41, WL-B1/B1c, WL-B3 between July 15 and August 31 to search for visible signs of vegetation stress including stress to trees and shrubs (e.g. wilting, discolored leaves, mortality, etc.). Coordinates and photographic documentation of observed vegetation stress shall be provided in the monitoring report.

6. The permittee shall include a detailed hydrology monitoring plan for wetlands WL-6, WL-2b, WL-A1, WL-A3, WL-C1, WL-40/41, WL-B1/B1c, and WL-B3 to assess potential changes to hydrology that may result in changes to wetland community, function and value. The plan shall include electronic monitoring wells placed along transects perpendicular to the water table. The permittee shall measure water levels at all monitoring wells shown in the monitoring plan daily.

7. The permittee shall conduct water chemistry sampling in wetlands WL-6, WL-2b, WL-A1, WL-A3, WL-C1, WL-40/41, WL-B1/B1c, and WL-B3 in accordance with the approved plan.

8. The permittee shall provide photographic documentation of all vegetation sampling transects during each monitoring year. At a minimum, photos shall be located at both ends of each transect and at each quadrat location when viewed from above. Photos must be labeled with the location, date photographed, and direction.

9. The permittee shall provide a written summary of data from previous monitoring periods and a discussion of changes or trends based on all monitoring results. This summary shall include a calculation of the acres of each wetland, a plan view drawing depicting each ecological type, and identification of all performance standards and whether each standard has been met.

10. The permittee shall provide a written summary of all the problem areas that have been identified and potential corrective measures to address them including any potential corrective actions based on results of the monitoring.

11. The permittee shall include a comprehensive invasive species monitoring plan as part of the wetland monitoring plan.

Reporting

A monitoring report, which compiles and summarizes all data collected during monitoring shall be submitted annually by the permittee. Monitoring reports shall cover the period of January 1 through December 31 and be submitted to the MDEQ-WRD prior to January 31 of the following year.

1. Figures including the baseline delineation with subsequent wetland boundary delineations shall be provided as part of the annual monitoring report.

2. Shapefiles of wetland boundaries shall be provided as part of the annual monitoring report.

In addition to the enactment of the Nuisance Management Plan for Fugitive Dust, Appendix A, Air Quality Permit 205-15, the permittee shall detail a dust monitoring plan as part of the wetland monitoring plan. A draft plan shall be submitted to MDEQ-WRD as an appendix of the wetland monitoring plan. The dust monitoring plan shall include identification of potential sources of dust contaminates that may deposit into wetlands and streams and identification of potential areas of impact (i.e. near roadways, near processing areas, etc.). A monitoring protocol shall be detailed and include monthly visual inspection of wetland in areas for dust deposition. A summary of monthly inspections shall be included with the annual wetland monitoring report during active construction, operations and closure activities at the site.

The following performance standards will be used to evaluate the assessed wetlands:

a. The surveyed boundary of each wetland shall not decrease by more than 0.01 acre at any time, as supported by the approved reference wetlands. A submeter accuracy GPS shall be used to survey the wetland boundary.

b. The average conservatism score (average C) for native wetland plants shall be greater than or equal to the baseline score at the end of the monitoring period. The Floristic Quality Index (FQI) shall be greater than or equal to the baseline at the end of the monitoring period.

c. The percent cover of invasive species (based on transects and plot data) shall not increase within wetlands WL-6, WL-2b, WL-A1, WL-A3, WL-C1, WL-40/41, WL-B1/B1c, WL-B3.

d. Wetland indicator status of all species per transect shall remain stable (e.g., no increase in drier rated species) and wetland type shall not change.

e. The wetland shall not show visible signs of vegetation stress including trees and shrubs.

f. Hydrology shall not show a decrease due to pumping.

g. Water levels shall be within 12 inches of the soil surface for 30 consecutive days starting at the beginning of the growing season.

If the performance standards listed above are not met, the permittee shall discontinue pumping and notify MDEQ-WRD immediately. The permittee shall provide a written summary to the MDEQ-WRD of all the problem areas that have been identified and potential corrective measures to address them, including any potential corrective actions based on results of the monitoring data and site observations.

Adaptive Management

The draft adaptive management plan received by MDEQ-WRD on May 19, 2018 identifies wetland hydrology augmentation as the proposed adaptive management technique. The permittee shall demonstrate that augmentation of hydrology will not alter water chemistry or temperature in wetlands and result in additional impacts to wetland chemistry, vegetative communities or alterations in biologic resource availability.

Prior to the commencement of regulated activies, the permittee must submit a comprehensive adaptive management plan, and the plan must be approved in writing by MDEQ-WRD. An adaptive management plan shall include, but is not limited to:

1. Methods of avoidance and minimization of impacts prior to enacting adaptive management techniques.

2. Clearly defined metrics to trigger enactment of adaptive management techniques.

3. An estimated schedule for implementation.

4. Potential impacts to wetlands and streams that may not be related to dewatering including the prevention of contamination, unanticipated discharges, and introduction of invasive species.

Cultural and Historic Artifacts

Cultural, historical, and/or archeological artifacts are known to occur in or near regulated areas of the project authorized by this permit and may be impacted by the permittee's activities.

The permittee shall submit an Unanticipated Discovery Plan to the MDEQ-WRD Upper Peninsula District Coordinator (906-228-4853) and the State Archeologist (517-373-1630) for review no less than 90 days prior to the onset of any activity in regulated areas authorized by this permit. The Unanticipated Discovery Plan shall include, at a minimum, the following:

1. Monitoring methods to occur during all surface disturbing activities in regulated areas or ancillary activities impacting regulated areas indirectly.
2. A communication strategy for reporting all unanticipated discoveries. Specifically:
    a. The permittee shall immediately suspend all mining and/or ground disturbing activities of potential impact, and promptly notify the MDEQ-WRD Upper Peninsula District Coordinator and the State Archaeologist in the event that any materials of possible archaeological, historical, and/or cultural value are unearthed during the course of any activity authorized by this permit.

b. If a qualified archaeologist determines that unanticipatedly discovered materials are in fact cultural, the permittee shall immediately notify the State Archeologist. In the event that pre-contact cultural materials are discovered, the permittee shall work with the State Archaeologist to notify all appropriate Tribal groups.

c. The permittee shall comply with applicable Tribal regulations and procedures, and obtain the concurrence of the appropriate Indian Tribe(s), on all proposed actions stemming from unanticipated discoveries of cultural origin. No work shall proceed until the State Archaeologist approves recommencement of work.

3. A training plan for all personnel, consultants, and contractors working in or potentially impacting regulated areas.

4. An unanticipated discoveries testing and evaluation strategy.

5. A strategy for unanticipated discoveries of human remains. Specifically, if human remains, or suspected human remains, are discovered during surface disturbing activities, the permittee shall immediately contact the appropriate Law Enforcement Agency by telephone and also notify that agency of the discovery in writing. No work shall proceed until the State Archaeologist approves recommencement of the work.

6. Monitoring and discovery reporting methods.

7. Identification of the parties responsible for onsite unanticipated discoveries monitoring during all activities authorized by this permit, as well as the contact information and professional credentials of those responsible parties. Responsible party contact information shall be reviewed by the permittee and update at least weekly to ensure accuracy.

The permittee shall implement the approved Unanticipated Discovery Plan throughout the project.

Site Stability

Prior to the initiation of the activities authorized by this permit, the Liquefaction Potential Assessment of the Menominee River Bank and the Menominee River Bank Geotechnical Stability Analysis shall be provided to OGMD to be reviewed by a geotechnical engineer. Written approval of the review shall be provided to MDEQ-WRD prior to the initiation of activities authorized by this permit. No discharges or impacts are authorized prior to MDEQ-WRD receiving written notification of approval of the geotechnical review.

Determination of Wetland Mitigation Requirement

Upon completion and MDEQ-WRD approval of the permittees final secondary impacts or indirect impacts analysis the final acreage of wetland mitigation will be determined by MDEQ-WRD in accordance with R 281.925. The analysis will be reviewed for conformity with R281.925 and the final mitigation ratio shall be determined by the MDEQ-WRD .

The permittee shall submit a final mitigation plan for MDEQ-WRD review. The plan shall include the wetland mitigation as included in the DRAFT wetland mitigation plan received and review by MDEQ-WRD on December 7, 2017, and additional mitigation as required by review and approval of a final secondary (indirect) impacts assessment.

The permittee is required to submit an approvable Wetland Mitigation and Monitoring Plan to the MDEQ-WRD for the proposed mitigation site shown in the attached location map within 60 days of the final determination of secondary impacts. The applicant must receive approval of the wetland mitigation plan from the MDEQ-WRD before undertaking any permitted activity. The wetland mitigation plan must contain:

a. Wetland mitigation goals and objectives, including the acreage (by ecological type) to be restored, created, or preserved and a description of the wetland to be impacted.

b. Characterization of the existing conditions at the proposed wetland mitigation site including:

   i. A description of the topography, soils, hydrology, and vegetation.
   ii. A plan view that includes topographic information (at one (1) foot contour intervals), roads, trails, structures, property lines, directional arrows, scale, and the exact size and boundaries of existing wetlands, streams, and floodplain to the 100-year elevation.
   iii. Typical cross-sections.

c. The proposed wetland mitigation design including:
   i. A description of the sources of hydrology, the source and type of soil amendments, wetland vegetation establishment, and wildlife structures.
   ii. A plan view showing all of the proposed conditions of the mitigation site including all contour elevations (at one (1) foot contour intervals), structures, the type and size of all proposed wetland areas, property lines, directional arrows, scale, and the conservation easement area.
   iii. Typical cross-sections.
   iv. A water budget of inputs and outputs to the proposed wetland (e.g., precipitation, groundwater, runoff, evapotranspiration).
   v. A vegetative establishment plan which includes a plan view, methods, species list with scientific and common names, type of propagule (seed, bare root stock, etc.), and source of any plant or seed stock.

d. Locations of vegetative sampling transects, photo points, monitoring wells, and staff gauges for monitoring should be shown on a plan view.

e. A schedule for completion of the mitigation site (e.g., initiation, grading, planting, introduction of hydrology, completion) and the site preparation and soil erosion/sedimentation control methods to be used during construction.

f. Information on current site ownership and provisions for the long-term protection of the site including methods to be used to prevent and control the establishment of invasive plant species, to prevent over-grazing of vegetation, and to remove trash.

Regulated activities authorized by this permit are prohibited until a final mitigation plan is submitted by the permittee and approved in writing by the MDEQ-WRD.

Wetland Mitigation

The permittee shall, in addition to any additional mitigation required after review of the final secondary (indirect) impacts analysis, as a primary condition of this permit, mitigate the loss of a minimum of 28.4 acres of wetland, consisting of 10.8 acres of emergent and 17.6 acres of forested wetland.

The authorization granted by this permit is contingent upon the completion of mitigation as follows:

a. The permittee shall preserve 294.24 acres of wetland by placing 507.74 acres of land into permanent conservation easement as shown on the attached Figure 2 – Proposed Preservation Area.

b. The permittee shall submit a surety bond or letter of credit to the MDEQ-WRD in a form identical to the financial assurance models on the MDEQ's website at www.michigan.gov/wetlands in the amount of $362,100 to ensure that the wetland preservation is completed, the conservation easements are recorded, signs are posted, short-term management activities are completed,

baseline conditions are documented, an adequate stewardship agreement and fund have been established, and all other mitigation actions are performed as required to comply with the requirements and conditions of this permit. The financial assurance document shall be provided to and accepted by MDEQ-WRD prior to signature of this permit by the MDEQ.

Prior to the transfer of this permit to another person, the new person must obtain and provide a financial instrument acceptable to the MDEQ-WRD in the name of the new person and in the amount required by this permit.

Upon request of the permittee and with the submittal of adequate proofs, the MDEQ-WRD may release portions of the financial instrument in accordance with the following guidelines:

i. 50% when adequate executed conservation easements are submitted to the MDEQ-WRD and recorded for all wetland preservation areas.
ii. 50% when short term management activities have been completed, a long term management plan has been submitted and approved by the MDEQ-WRD and when related stewardship agreements and a non-wasting endowment has been established.

c. The permittee shall submit the baseline report to MDEQ-WRD within 180 days of the final determination of mitigation requirement. The baseline report shall include a land use history, a wetland delineation, a current aerial photo, and a plan view. The plan view should include identification of property lines, natural features (streams, endangered plants or animals, etc.), existing and adjacent land uses (roads, utility lines, structures, vegetation management areas, trails, etc.) areas of invasive species, and other anthropogenic influences (stormwater, etc.). The baseline report shall also identify primary threats to the site, and short term management activities to address those threats.

d. The permittee shall submit a long term management plan for all wetland preservation areas to MDEQ-WRD for approval by within 60 days of the final determination of mitigation requirement. The long-term management plan shall include provisions for monitoring, placement and maintenance of signage and fencing, periodic inspection of the site, removal of trash and debris, control of invasive species, annual reporting, and any other site-specific management practices. The long term management plan shall provide for stewardship agreements and endowments for all wetland preservation areas.

e. A stewardship agreement with a land conservancy or other long-term management organization and the MDEQ-WRD, that is in compliance with the MDEQ-WRD approved long-term management plan, shall be established and recorded for all wetland preservation areas within 90 days of the final mitigation determination.

Wetland Restoration:

a. A plan detailing the restoration of approximately 1 acre of roadway within the preservation area shall be submitted to MDEQ-WRD for review and written approval by September 30, 2018.

b. The mitigation grading, planting, and introduction of hydrology shall be completed prior to or concurrent with initiating any other permitted activities and shall be completed prior to September 30, 2019.

c. Unless approved in writing by the MDEQ-WRD, restored wetlands shall be graded at the same elevation (i.e. flat). The mitigation site shall not be fine graded, but shall be left in a rough grade state (allowing for the establishment of micro-topography). Any planting or seeding of the mitigation site must consist of native Michigan plant materials endemic to the project area.

d. The permittee shall notify the MDEQ-WRD's District Office, in writing and within 20 days of completion of each of the following items:

    1) final grading
    2) seeding and plant installation

e. In the event the permitted activity is begun but not completed, the permittee or owner of record shall remain responsible for completion of the mitigation wetland and associated conditions, as determined by the MDEQ-WRD. Such determinations shall be based upon the extent of the disturbance to the existing wetlands.

g. Should the mitigation wetland fail to become established after two complete growing seasons, or fail to progress satisfactorily towards a self-sustaining wetland system as required by this permit, the permittee shall:

    i. Assess the problem and its probable causes;
    ii. Develop reasonable and necessary corrective measures as a revision to original plans;
    iii. Submit proposed corrective measures to the MDEQ-WRD for confirmation and approval within 60 days of identification of the problem; and
    iv. Upon MDEQ-WRD approval, implement corrective measures.

Additional mitigation monitoring may be required to evaluate the success of the corrective measures.

Wetland Mitigation Performance Standards

The following performance standards will be used to evaluate the mitigation wetland:

a. Construction has been completed in accordance with the MDEQ-WRD's approved plans and specifications included in the permit and mitigation plan.

b. The mitigation wetland is characterized by the presence of water at a frequency and duration sufficient to support a predominance of wetland vegetation and the wetland types specified at the end of the monitoring period.

c. A layer of high-quality topsoil, from the A horizon of an organic or loamy surface texture soil, is placed (or exists) over the entire wetland mitigation area at a minimum thickness of six (6) inches.

d. The mitigation wetland shall be free of oil, grease, debris, and all other contaminants.

e. A minimum of six (6) wildlife habitat structures, consisting of at least three (3) types, have been placed per acre of mitigation wetland. At least 50 percent of each structure shall extend above the normal water level. The types of acceptable wildlife habitat structures are:

    i. Tree stumps laid horizontally within the wetland area. Acceptable stumps shall be a minimum of 6 feet long (log and root ball combined) and 12 inches in diameter.
    ii. Logs laid horizontally within the wetland area. Acceptable logs shall be a minimum of 10 feet long and 6 inches in diameter.
    iii. Whole trees laid horizontally within the wetland area. Acceptable whole trees shall have all of their fine structure left intact (i.e., not trimmed down to major branches for installation), be a minimum of 20 feet long (tree and root ball), and a minimum of 12 inches in diameter.
    iv. Snags which include whole trees left standing that are dead or dying, or live trees that will be flooded and die, or whole trees installed upright into the wetland. A variety of tree species should be used for the creation of snag habitat. Acceptable snags shall be a minimum of 20 feet tall (above the ground surface) and a minimum of 12 inches in diameter at breast

height. Snags should be grouped together to provide mutual functional support as nesting, feeding, and perching sites.

v. Sand mounds at least 18 inches in depth and placed so that they are surrounded by a minimum of 30 feet of water measuring at least 18 inches in depth. The sand mound shall have at least a 200 square foot area that is 18 inches above the projected high water level and oriented to receive maximum sunlight.

f. The mean percent cover of native wetland species in the herbaceous layer at the end of the monitoring period is not less than:

60 percent for emergent wetland.
80 percent for scrub-shrub wetland.
80 percent for forested wetland.

Extensive areas of open water and submergent vegetation areas having no emergent and/or rooted floating vegetation shall not exceed 20 percent of the mitigation wetland area. Extensive areas of bare soil shall not exceed five percent of the mitigation wetland area. For the purposes of these performance standards, extensive refers to areas greater than 0.01 acre (436 square feet) in size.

The total percent cover of wetland species in each plot shall be averaged for plots taken in the same wetland type to obtain a mean percent cover value for each wetland type. For the purposes of this standard, total percent cover is the percent cover of the ground surface covered by vegetation, bare soil, and open water, when viewed from above. Total percent cover cannot exceed 100 percent. Plots within identified extensive open water and submergent areas, bare soil areas, and areas without a predominance of wetland vegetation shall not be included in this average. Wetland species refers to Facultative and wetter species according to the U.S. Army Corps of Engineers “National Wetland Plant List” for Michigan.

g. The mitigation wetland supports a predominance of wetland vegetation (as defined in the US Army Corps of Engineers Wetlands Delineation Manual" and appropriate regional supplement) in each vegetative layer, represented by a minimum number of native wetland species, at the end of the monitoring period. The minimum number of native wetland species per wetland type shall not be less than:

15 species within the emergent wetland.
15 species within the scrub-shrub wetland.
15 species within the forested wetland.

The total number of native wetland plant species shall be determined by a sum of all species identified in sample plots of the same wetland type.

h. At the end of the monitoring period, the mitigation wetland supports a minimum of:

- Three hundred (300) individual surviving, established, and free-to-grow trees per acre in the forested wetland that are classified as native wetland species and consisting of at least three different species.
- Three hundred (300) individual surviving, established, and free-to-grow shrubs per acre in the scrub-shrub wetland that are classified as native wetland species and consisting of at least four different species.
- Optional: Eight (8) native wetland species of grasses, sedges, or rushes per acre in the wet meadow wetland.

Physiognomic classification of trees and shrubs shall be in accordance with the Michigan Floristic Quality Assessment (Michigan Department of Natural Resources, 2001).

The 30 foot radius plot data shall be averaged to obtain the number of individual surviving, established, and free-to-grow trees and shrubs per acre. Free-to-grow shall be defined as transplanted or natural trees or shrubs that are essentially healthy, require no further maintenance, and are free from competing herbaceous vegetation.

For the purposes of this performance standard, *Fraxinus pennsylvanica* (Green Ash) and *Populus* spp. (Aspen) are not acceptable species

i. The mean percent cover of invasive species including, but not limited to, *Phragmites australis* (Common Reed), *Lythrum salicaria* (Purple Loosestrife), *Frangula alnus* (Glossy Buckthorn), *Rhamnus cathartica* (Common Buckthorn), *Alliaria petiolata* (Garlic Mustard), and *Phalaris arundinacea* (Reed Canary Grass) *Typha angustifolia* (Narrow-Leaved Cat-tail) and *Typha Glauca* (Hybrid Cat-tail) shall in combination be limited to no more than ten (10) percent within each wetland type. Invasive species shall not dominate the vegetation in any extensive area of the mitigation wetland.

   If the mean percent cover of invasive species is more than ten (10) percent within any wetland type or if there are extensive areas of the mitigation wetland in which an invasive species is one of the dominant plant species, the permittee shall submit an evaluation of the problem to the MDEQ-WRD. If the permittee determines that it is infeasible to reduce the cover of invasive species to meet the above performance standard, the permittee must submit an assessment of the problem, a control plan, and the projected percent cover that can be achieved for review by the MDEQ-WRD. Based on this information, the MDEQ-WRD may approve an alternative invasive species standard. Any alternative invasive species standard must be approved in writing by the MDEQ-WRD.

If the mitigation wetland does not satisfactorily meet these standards by the end of the monitoring period, or is not satisfactorily progressing during the monitoring period, the permittee will be required to take corrective actions.

Wetland Mitigation Monitoring

The permittee shall monitor the wetland mitigation for a minimum of five (5) years following grading, planting, and introduction of hydrology. A monitoring report, which compiles and summarizes all data collected during the monitoring period, shall be submitted annually by the permittee. Monitoring reports shall cover the period of January 1 through December 31 and be submitted to the MDEQ-WRD prior to January 31 of the following year. The permittee shall conduct the following activities and provide the information collected in the monitoring reports:

a. Measure inundation and saturation at all staff gauges, monitoring wells, and other stationary points shown in the mitigation plan monthly during the growing season. Hydrology data shall be measured at a sufficient number of points sampled at a sufficient frequency to accurately depict the water regime of each wetland type.

b. Sample vegetation in plots located along transects shown in the mitigation plan once between July 15 and August 31. Woody vegetation may be sampled earlier in the growing season to allow for accurate counts. The number of sample plots necessary within each wetland type shall be determined by use of a species-area curve or other approach approved by the MDEQ-WRD. The minimum number of sample plots for each wetland type shall be no fewer than five (5). Sample plots shall be located on the sample transect at evenly spaced intervals or by another approach acceptable to the MDEQ-WRD. If additional or alternative sample transects are needed to

sufficiently evaluate each wetland type, they must be approved in advance in writing by the MDEQ-WRD.

The herbaceous layer (all non-woody plants and woody plants less than 3.2 feet in height) shall be sampled using a 3.28 foot by 3.28 foot (one square meter) sample plot. The shrub and tree layer shall be sampled using a 30-foot radius sample plot. The data recorded for each herbaceous layer sample plot shall include a list of all living plant species, and an estimate of percent cover in five (5) percent intervals for each species, bare soil areas, and open water areas relative to the total area of the plot. The number and species of surviving, established, and free-to-grow trees and surviving, established, and free-to-grow shrubs shall be recorded for each 30-foot radius plot.

Provide plot data and a list of all the plant species identified in the plots and otherwise observed during monitoring. Data for each plant species must include common name, scientific name, wetland indicator category from the U.S. Army Corps of Engineers 2016 National Wetland Plant List for Michigan (Lichvar, R.W. 2012), physiognomic classification, and whether the species is considered native according to the Michigan Floristic Quality Assessment (Michigan Department of Natural Resources, 2001). Nomenclature shall follow in the *Flora of North America*, which can be found at www.fna.org.

The locations of sample transects and plots shall be identified in the monitoring report on a plan view showing the location of wetland types. Each transect and sample plot shall be permanently and visibly staked at a frequency sufficient to locate the transect and sample plots in the field.

c. Delineate any extensive (greater than 0.01 acre in size) open water areas, bare soil areas, areas dominated by invasive species, and areas without a predominance of wetland vegetation, and provide their location on a plan view.

d. Document any sightings or evidence of wading birds, songbirds, waterfowl, amphibians, reptiles, and other animal use (lodges, nests, tracks, scat, etc.) within the wetland noted during monitoring. Note the number, type, date, and hour of the sightings and evidence.

e. Inspect the site, during all monitoring visits and inspections, for oil, grease, man-made debris, and all other contaminants and report findings. Rate (e.g., poor, fair, good, excellent) and describe the water clarity in the mitigation wetland.

f. Provide annual photographic documentation of the development of the mitigation wetland during vegetation sampling from permanent photo stations located within the mitigation wetland. At a minimum, photo stations shall be located at both ends of each transect. Photos must be labeled with the location, date photographed, and direction.

g. Provide one-time photographic documentation during construction of the placement of at least six (6) inches of high quality soil, from the A horizon of an organic or loamy surface texture soil, across the site.

h. Provide the number and type of habitat structures placed and representative photographs of each structure type.

i. Provide a written summary of data from previous monitoring periods and a discussion of changes or trends based on all monitoring results. This summary shall include a calculation of the acres of each wetland type established, a plan view drawing depicting each ecological type, and identification of all performance standards and whether each standard has been met.

j. Provide a written summary of all the problem areas that have been identified and potential corrective measures to address them.

A qualified individual able to identify plants to genus and species must conduct the wetland monitoring. The MDEQ-WRD reserves the right to reject reports with substandard monitoring data.

The MDEQ-WRD will determine if the performance standards have been met. If the performance standards have not been met, the MDEQ-WRD may require corrective actions and subsequent annual monitoring until final approval from the MDEQ-WRD can be granted.

Prior to final written approval of the mitigation by the MDEQ-WRD, the permittee shall submit the following:

i. A written statement that the mitigation is complete and request for final approval of the mitigation.
ii. A copy of the permit.
iii. "As-built" plans and specifications signed and sealed by a registered surveyor or licensed engineer.
iv. A surveyed boundary of the established wetland within the mitigation area, including the total acreage of the mitigation wetland and the acreage of each type of wetland created. The wetland boundary shall be flagged and numbered in the field to allow easy identification by MDEQ-WRD field staff.
v. Complete all monitoring requirements including the submittal of all required monitoring reports.

Stream – General

Fencing shall be elevated at or above the bankfull elevation of the stream channel. Fencing shall be monitored after rainfall events and debris shall be removed from the fencing material within the flood prone areas of the stream.

Stream Mitigation

The permittee shall, as a primary condition of this permit, mitigate the loss of stream functions and services due to the placement of fill within 253 linear feet of stream channel and additional indirect impacts resulting in the loss of habitat, function and value of regulated streams.

Upon MDEQ-WRD approval of the permittee's indirect stream impacts analysis, the permittee shall complete a stream functional lift assessment and evaluate functional losses from authorized stream impacts and to determine appropriate stream mitigation measures to ensure functional lift at a ratio of at least 1:1 for all impacted stream functions and values.

The permittee shall, as a primary condition of this permit, submit a comprehensive stream mitigation plan based on the required stream functional loss and corresponding mitigation functional lift assessment and evaluation. Further:

1. The submitted plan shall include performance standards based on quantifiable, measureable metrics that gauge stream mitigation functional lift.

2. When implemented, the approve stream mitigation plan shall demonstrate through performance standard metrics to achieve requisite functional lift in the stream mitigation reaches.

MDEQ-WRD approval of the submitted stream mitigation plan is required prior to the initiation of any activities in regulated areas authorized by this permit.

The authorization granted by this permit is contingent upon the permittee providing a surety bond or letter of credit to the MDEQ-WRD in a form identical to the financial assurance models on the MDEQ's website at www.michigan.gov/deqwetlands. The submitted financial assurance shall:

1. Provide coverage in the amount of $71,000 to ensure that the stream mitigation to compensate for 253 linear feet of direct impacts is constructed, the attendant conservation easement is recorded, monitoring is completed, and necessary corrective actions are performed as required to comply with the mitigation requirements of this permit.

2. Be increased by $280 per linear foot of proposed, additional stream mitigation necessary to compensate for functional losses at a ratio of at least 1:1 for all indirect stream impacts.

The financial assurance document must be provided to and accepted by the MDEQ-WRD prior to the start of any work in regulated areas authorized by this permit.

Prior to the transfer of this permit to another person, the new person must obtain and provide a financial instrument acceptable to the MDEQ-WRD in the name of the new person and in the amount required by this permit.

Upon request of the permittee, and with the submittal of adequate proofs, the MDEQ-WRD may release portions of the financial instrument in accordance with the following guidelines:

Fifty (50) percent of the financial instrument may be released after the permittee demonstrates substantial compliance with the approved stream mitigation plan performance standards in this permit for a minimum of two years after construction of the stream mitigation, MDEQ-WRD concurs that the mitigation grading and planting have been completed, and the pattern, dimension, and profile indicative of a dynamically stable stream reach have been maintained after a minimum of two flow events that meet or exceed the bankfull discharge.

The remaining 50 percent of the financial instrument will be released upon all of the following:

1. Demonstration that natural channel design has been implemented to achieve and maintain a stable stream pattern, dimension, and profile for:

    a. At least 5 years following mitigation construction

    b. At least two bankfull events to demonstrate long-term stability of the restored stream channel

2. Submittal of at least 5 annual monitoring reports documenting

    a. Implementation of a natural channel design

    b. Achievement of all functional lift performance standard metrics included in the approved stream mitigation plan.

    c. Achievement of a stable stream pattern, dimension, and profile

3. Substantial compliance with all additional performance standards as specified in the MDEQ-WRD approved stream mitigation plan.

4. Final written approval by the MDEQ-WRD.

Stream Mitigation Performance Standards

The following performance standards will be used to evaluate the stream mitigation project:

a. Construction has been completed in accordance with the MDEQ-WRD's approved plans and specifications included in the permit and mitigation plan.

b. Restoration of the stream channel to a stable pattern, dimension, and profile based on reference stream parameters and the mitigation plan. Maintenance of stable stream parameters for two bankfull (or greater) flow events and at least one flow event that results in over-bank flooding.

c. The stream and riparian buffer mitigation area shall be free of oil, grease, debris, and all other contaminants.

d. Any in-stream structures (i.e., cross-vanes, wood, constructed riffles, etc.) shall perform as designed. The structures shall stay in place and there shall be no bank erosion, piping, undermining, end around, or other indication of instability associated with the in-stream structures including no buoyancy issues with wood structures.

e. At the end of the monitoring period, the mitigated stream shall exhibit floodplain connectivity appropriate for proper stream functioning as evidenced by a weighted Bank Height Ratio of 1.0-1.1, and a weighted Entrenchment Ratio of >2.2 for Rosgen channel types C and E, and ≥1.4 for Rosgen channel types B and Bc.

f. At the end of the monitoring period, the mitigated stream shall exhibit bedform diversity appropriate for proper stream functioning. Appropriate bedform diversity shall be demonstrated by the pool to pool spacing ratio and pool max depth ratio. The pool to pool spacing ratio for Rosgen channel types C and E in watersheds <10 square miles shall be 4-5 bankfull widths and in watersheds >10 square miles shall be 5-7 bankfull widths; Rosgen channel types A and B shall be 1-5 bankfull widths based on channel slope. The pool max depth ratio shall be >1.5 for Rosgen channel types A and B and gravel dominated Rosgen channel types C and E; and >1.2 for sand dominated Rosgen channel types C and E.

g. At the end of the monitoring period, the mitigated stream shall exhibit bank migration and lateral stability appropriate for proper stream functioning as evidenced by a dominant Bank Erosion Hazard Index (BEHI) score and a Near Bank Stress (NBS) score combination (BEHI/NBS) of Moderate/Very Low; Low/Very Low; Low/Low; Low/Moderate; or Low/High.

h. At the end of the monitoring period, the mitigated stream shall exhibit an amount of Large Woody Debris (LWD) appropriate for proper stream functioning as evidenced by a LWD Index greater than 300, or a LWD Index equal to or greater than the LWD Index for a DEQ approved reference reach.

i. At the end of the monitoring period, the mitigated stream shall exhibit a vegetated Riparian Buffer as evidenced by a weighted average buffer width, measured horizontally from the water's edge, equal to or greater than 50 feet on each side of the channel.

j. Riparian Vegetation Cover: The mean percent cover of native species in the herbaceous layer of each riparian buffer zone (1, 2, and 3) is not less than 70 percent at the end of the monitoring period.

   Extensive areas of bare soil shall not exceed five percent of the mitigation area. For the purposes of these performance standards, extensive refers to areas greater than 0.01 acre (436 square feet) in size.

   The total percent cover of native species in each plot shall be averaged for plots taken in the same riparian buffer zone to obtain a mean percent cover value for each riparian buffer zone: 1, 2, and 3. For the purposes of this standard, total percent cover is the percent cover of the ground surface

covered by vegetation, bare soil, and open water, when viewed from above. Total percent cover cannot exceed 100 percent. Plots within identified bare soil areas and areas without a predominance of native vegetation shall not be included in this average. Riparian buffer zone 1 begins at the water's edge and extends to the landward edge of the bankfull floodplain shelf. Riparian buffer zone 2 begins at the landward edge of the bankfull floodplain shelf and extends ten (10) feet landward of the top of the bank, if applicable based on channel cross-section). Riparian buffer zone 3 begins ten (10) feet landward of the top of the bank and extends to the outside edge of the riparian buffer.

k. Riparian Vegetation Diversity: The stream mitigation riparian buffer supports a predominance of native vegetation in each vegetative layer, represented by a minimum number of native species, at the end of the monitoring period. The minimum number of native species shall not be less than 15 species within the riparian buffer.

   The total number of native plant species shall be determined by a sum of all species identified in sample plots.

l. Riparian Vegetation Density: At the end of the monitoring period, the stream mitigation riparian buffer supports a minimum of:

   - Three hundred (300) individual surviving, established, and free-to-grow trees per acre in the riparian buffer zone 3 that are classified as native species and consisting of at least three different species.
   - Five hundred (500) individual surviving, established, and free-to-grow trees or shrubs per acre in the riparian buffer zone 2 that are classified as native species and consisting of at least four different species.
   - Optional: Eight (8) native wetland species of grasses, sedges, or rushes per acre in the riparian buffer zone 1.

   Physiognomic classification of trees and shrubs shall be in accordance with the Michigan Floristic Quality Assessment (Michigan Department of Natural Resources, 2001).

m. The mean percent cover of invasive species in the stream channel and associated riparian buffer including, but not limited to, *Phragmites australis* (Common Reed), *Lythrum salicaria* (Purple Loosestrife), *Frangula alnus* (Glossy Buckthorn), *Rhamnus cathartica* (Common Buckthorn), *Alliaria petiolata* (Garlic Mustard), and *Phalaris arundinacea* (Reed Canary Grass) *Typha angustifolia* (Narrow-Leaved Cat-tail) and *Typha Glauca* (Hybrid Cat-tail) shall in combination be limited to no more than ten (10) percent within each riparian vegetation zone. Invasive species shall not dominate the vegetation in any extensive area of the stream channel and associated riparian buffer.

   If the mean percent cover of invasive species in the stream channel and associated riparian buffer is more than ten (10) percent within any riparian vegetation zone or if there are extensive areas of the stream channel or associated riparian buffer in which an invasive species is one of the dominant plant species, the permittee shall submit an evaluation of the problem to the MDEQ-WRD. If the permittee determines that it is infeasible to reduce the cover of invasive species to meet the above performance standard, the permittee must submit an assessment of the problem, a control plan, and the projected percent cover that can be achieved for review by the MDEQ-WRD. Based on this information, the MDEQ-WRD may approve an alternative invasive species standard. Any alternative invasive species standard must be approved in writing by the MDEQ-WRD.

n. By the end of year 3 of the monitoring period, the Water Temperature in the mitigated stream shall be within the same stream temperature classification (e.g., warm, cool, cool-transitional, cold) as either the impacted stream or a DEQ approved reference stream.

o. Throughout the monitoring period, the mitigated stream shall exhibit a Water Velocity appropriate for proper stream functioning as evidenced by an average bankfull water velocity of 3-6 feet per second (fps) for Rosgen channel types C and E; <3 fps for Rosgen channel type Cc; or 4-6 fps for Rosgen channel type B.

If the stream mitigation does not satisfactorily meet these standards and the functional life metrics specified in the MDEQ-WRD approved stream mitigation plan by the end of the monitoring period, or is not satisfactorily progressing during the monitoring period, the permittee will be required to take corrective actions.

Stream Mitigation Monitoring

The permittee shall monitor the stream mitigation for a minimum of five (5) years following grading, planting, and introduction of hydrology. A monitoring report, which compiles and summarizes all data collected during the monitoring period, shall be submitted annually by the permittee. Monitoring reports shall cover the period of January 1 through December 31 and be submitted to the MDEQ-WRD prior to January 31 of the following year. The permittee shall conduct the following activities and provide the information collected in the monitoring reports:

a. Provide annual photographic documentation of the development of the mitigation stream channel and the associated riparian buffer from permanent photo stations located within the mitigated stream channel. At a minimum, photo stations shall be located at each cross-section and include each in-stream structure (i.e., cross-vanes, wood, or constructed riffles, etc.), if applicable. Photos must be labeled with the location, date photographed, and direction. A map of the locations of the photo stations shall be included.

b. Stream pattern, dimension, and profile should be measured on an annual basis by conducting longitudinal profile and cross-section surveys. Based upon final design, a determined amount of riffles and pool cross-sections per each determined reach of stream channel or portion thereof shall be permanently monumented and each cross-section shall be surveyed annually. Channel sinuosity, bankfull width, depth and cross-sectional area, as well as width to depth ratio, percent riffle, pool to pool spacing ratio, pool max depth ratio, bank height ratio, and entrenchment ratio should all be reported. Current year cross-sections and profile should be presented overlaid with survey results from all previous monitoring years and as-built surveys.

c. Sample vegetation in plots located along transects shown in the mitigation plan once between July 15 and August 31. Woody vegetation may be sampled earlier in the growing season to allow for accurate counts. The number of sample plots necessary within each riparian vegetation zone shall be determined by use of a species-area curve or other approach approved by the MDEQ-WRD. The minimum number of sample plots for each riparian vegetation zone shall be no fewer than five (5). Sample plots shall be located on the sample transect at evenly spaced intervals or by another approach acceptable to the MDEQ-WRD. If additional or alternative sample transects are needed to sufficiently evaluate each riparian vegetation zone, they must be approved in advance in writing by the MDEQ-WRD.

   The herbaceous layer (all non-woody plants and woody plants less than 3.2 feet in height) shall be sampled using a 3.28 foot by 3.28 foot (one square meter) sample plot. The shrub and tree layer shall be sampled using a 30-foot radius sample plot. Plot shape may be adjusted based on width of riparian buffer zone. The data recorded for each herbaceous layer sample plot shall include a list of all living plant species, and an estimate of percent cover in five (5) percent intervals for each species, bare soil areas, and open water areas relative to the total area of the plot. The number

and species of surviving, established, and free-to-grow trees and surviving, established, and free-to-grow shrubs shall be recorded for each 30-foot radius plot.

Provide plot data and a list of all the plant species identified in the plots and otherwise observed during monitoring. Data for each plant species must include common name, scientific name, wetland indicator category from the U.S. Army Corps of Engineers 2012 National Wetland Plant List for Michigan (Lichvar, R.W. 2012), physiognomic classification, and whether the species is considered native according to the Michigan Floristic Quality Assessment (Michigan Department of Natural Resources, 2001). Nomenclature shall follow in the *Flora of North America*, which can be found at www.fna.org.

The locations of sample transects and plots shall be identified in the monitoring report on a plan view showing the location of riparian vegetation zones. Each transect and sample plot shall be permanently and visibly staked at a frequency sufficient to locate the transect and sample plots in the field.

d. Delineate any extensive (greater than 0.01 acre in size) bare soil areas, areas dominated by invasive species, and areas without a predominance of native vegetation, and provide their location on a plan view.

e. Inspect the site, during all monitoring visits and inspections, for oil, grease, man-made debris, and all other contaminants and report findings. Rate (e.g., poor, fair, good, excellent) and describe the water clarity in the stream channel.

f. Document substrate characteristics and any areas of erosion and/or deposition within the stream channel.

g. Measure and document all quantitative stream functional lift metrics.

h. Assess the stability and performance of any in-stream structures or large woody debris features.

i. Provide a written summary of data from previous monitoring periods and a discussion of changes or trends based on all monitoring results. This summary shall include identification of all performance standards and whether each standard has been met. A table containing this information shall be included, and shall compare current year monitoring data to data from previous years' surveys.

j. Provide a written summary of all the problem areas that have been identified and potential corrective measures to address them.

k. Provide documentation that the mitigated stream channel has experienced two flow events equal to or greater than bankfull flow, and that at least one flow event during the five year monitoring period has resulted in over-bank flooding (i.e., a flow event greater than bankfull flow).

l. The Permittee shall conduct all other measurements needed to document that performance standards are met.

The MDEQ-WRD will determine if the performance standards have been met. If the performance standards have not been met, the MDEQ-WRD may require corrective actions and subsequent annual monitoring until final approval from the MDEQ-WRD can be granted.

Prior to final written approval of the mitigation by the MDEQ-WRD, the permittee shall submit the following:

i. A written statement that the mitigation is complete and request for final approval of the mitigation.

ii. A copy of the permit.
iii. "As-built" plans and specifications signed and sealed by a registered surveyor or licensed engineer.
iv. Complete all monitoring requirements including the submittal of all required monitoring reports.

Regulated activities authorized by this permit are prohibited until a complete and final mitigation plan is submitted by the permittee, including the baseline ecological assessment and third-party stewardship agreement and non-wasting endowment, and these mitigation items are approved in writing by the MDEQ-WRD.

If the construction of the wetland mitigation has not been completed due to the fact that the activities authorized by this permit have not been initiated, then the permittee shall provide a written status report by December 31 annually until the wetland mitigation construction is complete. The written status report shall document the anticipated start date and completion date of the permitted activities and the wetland mitigation construction. The status report shall not be considered in lieu of or as a substitution for any of the annual monitoring reports required by this permit.

Stream and Wetland Mitigation Conservation Easement

The permittee shall provide the following documentation of ownership for the wetland mitigation site. This documentation must be submitted with the original executed conservation easement to the address above.

- A 50-year ownership history including copies of all deeds, encumbrances, easements, severed mineral rights, and other pertinent documents.
- A written statement from the property owner that there are no easements, encumbrances, or transfers of the property, in whole or in part, not disclosed in the title search or ownership history.
- Subordination of any property interest (e.g., mineral rights, mortgages, easements) which would interfere with establishment and protection of the conservation easement.
- A title insurance policy insuring the conservation easement area in the name of the MDEQ-WRD, in an amount determined by the MDEQ-WRD.
- If the property owner is a company, documentation that the person executing the conservation easement has the authority to convey land on behalf of the company.

The permittee shall execute a conservation easement over the stream and wetland mitigation area, including the associated riparian buffers and remaining on-site stream channel shown on the permit plans, in a form identical to the conservation easement model on the MDEQ-WRD's website at www.michigan.gov/wetlands. The original executed conservation easement and associated exhibits must be sent to the MDEQ-WRD for review and recording within 60 days of the issuance of this permit. Send to:

Conservation Easement Coordinator
MDEQ Water Resources Division
P.O. Box 30458
Lansing, Michigan, 48909

A copy of the executed easement must also be mailed to the MDEQ-WRD Upper Peninsula District Office.

The permittee may request in writing a permit revision to extend the time deadline for submittal of the conservation easement. Such permit revision shall be considered a minor permit revision pursuant to Section 30313b and must be accompanied by the appropriate fee. An acceptable executed conservation easement must be submitted to the MDEQ-WRD by the permittee prior to commencement of any permitted work within regulated areas.

The conservation easement boundary shall be demarcated by the placement of signs along the perimeter. The signs shall be placed at an adequate frequency, visibility, and height for viewing, made of a suitable material to withstand climatic conditions, and should be replaced as needed. The signs shall include the following language:

WETLAND AND STREAM CONSERVATION EASEMENT
NO CONSTRUCTION OR PLACEMENT OF STRUCTURES ALLOWED.
NO MOWING, CUTTING, FILLING, DREDGING OR
APPLICATION OF CHEMICALS ALLOWED.
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Except as otherwise provided by this permit or approved in writing by the MDEQ-WRD, the following activities are prohibited in perpetuity within the mitigation area: alteration of topography, creation of paths, trails, or roads; placement of fill, dredging, or excavation; drainage of surface or groundwater; construction or placement of any structure; plowing, tilling, or cultivating the soils or vegetation; cutting, removal, or alteration of vegetation; including the planting of non-native plant species; construction of unauthorized utility or petroleum lines; storage or disposal of garbage, trash, debris, abandoned equipment; accumulation of machinery or other waste materials; use or storage of off-road vehicles; placement of billboards or signs; or the use of the stream or wetland for the discharge of storm water other than that allowed in this permit.

Conditional Permit

This permit is granted conditionally. Should this permit result in an unreasonable encroachment, interference with adjoining riparians or adverse impacts to the public trust, permittee agrees, in exercising the authority granted herein, to make adjustments in the project as ordered by the MDEQ-WRD.

The permittee is hereby notified that portions of the parcel, not covered by this permit, fall under the regulatory authority of Part 301, Inland Lakes and Streams, and/or Part 31, Floodplain Regulatory Authority/Water Resources Protection, and/or Part 303, Wetlands Protection, of the NREPA. A permit from the MDEQ's Water Resources Division may be required for certain regulated activities. Failure to comply with the requirements of the NREPA may subject the owner to compliance actions as provided by statute.

Permittee shall provide the name, address, and telephone number of the person that the MDEQ can contact if necessary and who has the authority to stop work on the project, as part of the counter-signed permit:

Name:

Print_____

Sign_____

Date_____

Address_____

_____

Telephone Number_____

FAX/Email_____

Upon signing by the permittee named herein, this permit must be returned to the MDEQ, [redacted] for final execution. This permit shall become effective on the date of the MDEQ representative's signature.

Permittee hereby accepts and agrees to comply with the terms and conditions of this permit.

X

_____

Permittee Date

X

_____

Printed Name and Title of Permittee

Issued By: _____

C. Heidi Grether
Director
Department of Environmental Quality

cc: Andrew Boushey, Aquila Resources
David Anderson, Aquila Resources
Steve Donahue, Foth, Agent
Kris Baron, Foth, Agent
Matt MacGregor, King & MacGregor Environmental, Agent
Jeff King, King & MacGregor Environmental, Agent
Teresa Seidel, MDEQ-WRD
Kim Fish, MDEQ-WRD
Jerrod Sanders, MDEQ-WRD
Amy Lounds, MDEQ-WRD
Steve Casey, MDEQ-WRD
Ryan McCone, MDEQ-WRD
Kristi Wilson, MDEQ-WRD
Jill Van Dyke, MDEQ-WRD
Mike Pennington, MDEQ-WRD
Colleen Okeefe, MDEQ-WRD
Peter Swenson, USEPA
Wendy Melgin, USEPA
Melaine Burdick, USEPA
Linda Hansen, MDEQ-WRD
Joe Maki, MDEQ-OGMD
Sherry MacKinnon, MDNR
Darren Kramer, MDNR
Eric Thompson, MDNR
Scott Goeman, MDNR
Dean Anderson, MSHDA
Russell Rassmussen, WDNR
Menominee County CEA
Menominee County Clerk
Menominee County Health Department
Lake Township Clerk